CLAIMS

WHAT IS CLAIMED:

1. A dual mode built-in self-test controller, comprising:

a logic built-in self-test domain, including:

a logic built-in self-test engine capable of executing a logic built-in self-test; and

a logic built-in self-test signature generated by an execution of the logic built-in self-test; and

a memory built-in self-test domain, including:

a memory built-in self-test engine capable of executing a memory built-in self-test.

2. The dual mode built-in self-test controller of claim 1, wherein the logic built-in self-test engine comprises:

a logic built-in self-test state machine; and

a pattern generator capable of generating a scan pattern for use in a state of the logic built-in self-test state machine.

3. The dual mode built-in self-test controller of claim 2, wherein the logic built-in self-test state machine further comprises:

a reset state entered upon receipt of an external reset signal;

an initiate state entered from the reset state upon receipt of a logic built-in self-test run signal;

a scan state entered from the initiate state upon the initialization of components and signals in the logic built-in self-test domain in the initiate state;

a step state entered into from the scan state and from which the scan state is entered unless the content of the pattern generator equals a predetermined vector count; and

a done state entered into from the step state when the content of the pattern generator equals the predetermined vector count.

4. The dual mode built-in self-test controller of claim 2, wherein the pattern generator comprises a linear feedback shift register seeded with a primitive polynomial.

5. The dual mode built-in self-test controller of claim 2, wherein the logic built-in self-test signature includes at least one of:

a bit indicating an error condition arose; and

a bit indicating whether the stored results are from a previous logic built-in self-test run.

6. The dual mode built-in self-test controller of claim 1, wherein the memory built-in self-test domain further comprises a memory built-in self-test signature generated by an execution of the memory built-in self-test.

7. The dual mode built-in self-test controller of claim 6, wherein the memory built-in self-test signature includes the results of at least one paranoid check.

8. The dual mode built-in self-test controller of claim 6, wherein the memory built-in self-test signature includes a bit indicating whether a memory built-in self-test is done.

9. The dual mode built-in self-test controller of claim 1, wherein the memory built-in self-test engine comprises:

a memory built-in self-test state machine; and

a nested memory built-in self-test engine operating the memory built-in self-test state machine.

10. The dual mode built-in self-test controller of claim 9, wherein the memory built-in self-test state machine comprises

a reset state entered upon receipt of an external reset signal;

an initiate state entered from the reset state upon receipt of at least one of a memory built-in self-test run signal and a memory built-in self-test select signal;

a flush state entered from the initiate state upon the initialization of components and signals in the memory built-in self-test domain in the initiate state;

a test state entered into from the flush state upon completing a flush of a plurality of memory components to a known state; and

a done state entered into upon completing the test of each of the memory components in the memory built-in self-test.

11. The dual mode built-in self-test controller of claim 1, wherein the memory built-in self-test engine comprises:

a plurality of alternative memory built-in self-test state machines; and

a nested memory built-in self-test engine operating a predetermined one of the memory built-in self-test state machines.

12. The dual mode built-in self-test controller of claim 11, wherein each of the memory built-in self-test engines comprises:

a reset state entered upon receipt of an external reset signal;

an initiate state entered from the reset state upon receipt of at least one of a memory built-in self-test run signal and a memory built-in self-test select signal;

a flush state entered from the initiate state upon the initialization of components and signals in the memory built-in self-test domain in the initiate state;

a test state entered into from the flush state upon completing a flush of a plurality of memory components to a known state; and

a done state entered into upon completing the test of each of the memory components in the memory built-in self-test.

13. A dual mode built-in self-test controller, comprising:

a logic built-in self-test domain, including:

means for executing a logic built-in self-test; and

means for storing the results of a logic built-in self-test generated by an execution of the logic built-in self-test; and

a memory built-in self-test domain, including:

means for executing a memory built-in self-test.

14. The dual mode built-in self-test controller of claim 13, wherein the logic executing means comprises:

a logic built-in self-test state machine; and

a pattern generator capable of generating a scan pattern for use in a state of the logic built-in self-test state machine.

15. The dual mode built-in self-test controller of claim 13, wherein the memory built-in self-test domain further comprises a means for storing the results of a memory built-in self-test by an execution of the memory built-in self-test.

16. The dual mode built-in self-test controller of claim 13, wherein the memory executing means comprises:

a memory built-in self-test state machine; and

a nested memory built-in self-test engine operating the memory built-in self-test state machine.

17. The dual mode built-in self-test controller of claim 13, wherein the memory executing means comprises:

a plurality of alternative memory built-in self-test state machines; and

a nested memory built-in self-test engine operating a predetermined one of the memory built-in self-test state machines.

18. An integrated circuit device, comprising:

a plurality of memory components;

a logic core;

a testing interface; and

a dual mode built-in self-test controller controlled through the testing interface, comprising:

a logic built-in self-test domain, including:

a logic built-in self-test engine capable of executing a logic built-in self-test on the logic core; and

a logic built-in self-test signature generated by an execution of the logic built-in self-test; and

a memory built-in self-test domain, including:

a memory built-in self-test engine capable of executing a memory built-in self-test on the memory components.

19. The integrated circuit device of claim 18, wherein the logic built-in self-test engine comprises:

a logic built-in self-test state machine; and

a pattern generator capable of generating a scan pattern for use in a state of the logic built-in self-test state machine.

20. The integrated circuit device of claim 18, wherein the memory built-in self-test domain further comprises a memory built-in self-test signature register generated by an execution of the memory built-in self-test.

21. The integrated circuit device of claim 18, wherein the memory built-in self-test engine comprises:

a memory built-in self-test state machine; and

a nested memory built-in self-test engine operating the memory built-in self-test state machine.

22. The integrated circuit device of claim 18, wherein the memory built-in self-test engine comprises:

a plurality of alternative memory built-in self-test state machines; and

a nested memory built-in self-test engine operating a predetermined one of the memory built-in self-test state machines.

23. The integrated circuit device of claim 18, wherein the memory components include a static random access memory device.

24. The integrated circuit device of claim 18, wherein testing interface comprises a Joint Test Action Group tap controller.

25. A method for performing a built-in self-test on an integrated circuit device, comprising:

externally resetting a dual mode built-in self-test controller;

performing at least one of a logic built-in self-test and a memory built-in self-test from the dual mode built-in self-test controller; and

obtaining the results of the performed built-in self-test.

26. The method of claim 25, wherein externally resetting the dual mode built-in self-test controller includes at least one of resetting a logic built-in self-test state machine in a logic built-in self-test engine and resetting a memory built-in self-test state machine in a memory built-in self-test engine.

27. The method of claim 25, wherein resetting the dual mode built-in self-test controller includes initializing a multiple input signature register and a pattern generator in a logic built-in self-test domain of the dual mode built-in self-test controller.

28. The method of claim 25, wherein performing the logic built-in self-test includes:

initiating a plurality of components and signals in a logic built-in self-test domain of the dual mode built-in self-test controller upon receipt of a logic built-in self-test run signal;

scanning a scan chain upon the initialization of the components and the signals;

stepping to a new scan chain; and

repeating the previous scanning and stepping until the content of a pattern generator equals a predetermined vector count.

29. The method of claim 28, further comprising at least one of:

setting a bit in the multiple input signature register indicating an error condition arose; and

setting a bit in the multiple input signature register indicating whether the stored results are from a previous logic built-in self-test run.

30. The method of claim 25, wherein performing the memory built-in self-test includes:

initiating a plurality of components and signals in a memory built-in self-test domain of the dual mode built-in self-test controller upon receipt of at least one of a memory built-in self-test run signal and a memory built-in self-test select signal;

flushing the contents of a plurality of memory components to a known state after initialization of the components and the signals in the memory built-in self-test domain; and

testing the flushed memory components.

31. The method of claim 30, wherein performing the memory built-in self-test further includes at least one of:

storing the results of the memory built-in self-test in a memory built-in self-test signature register;

storing the results of at least one paranoid check in the memory built-in self-test signature register;

setting a bit in the memory built-in self-test signature register indicating whether the memory built-in self-test is done.

32. A method for testing an integrated circuit device, comprising:

interfacing the integrated circuit device with a tester;

externally resetting a dual mode built-in self-test controller;

performing a logic built-in self-test from the dual mode built-in self-test controller;

performing a memory built-in self-test from the dual mode built-in self-test controller;

obtaining the results of the performed logic built-in self-test and the performed memory built-in self-test.

33. The method of claim 32, wherein externally resetting the dual mode built-in self-test controller includes at least one of resetting a logic built-in self-test state machine in a logic built-in self-test engine and resetting a memory built-in self-test state machine in a memory built-in self-test engine.

34. The method of claim 32, wherein performing the logic built-in self-test includes:

initiating a plurality of components and signals in a logic built-in self-test domain of the dual mode built-in self-test controller upon receipt of a logic built-in self-test run signal;

scanning a scan chain upon the initialization of the components and the signals;

stepping to a new scan chain; and

repeating the previous scanning and stepping until the content of a pattern generator equals a predetermined vector count.

35. The method of claim 32, wherein performing the memory built-in self-test includes:

initiating a plurality of components and signals in a memory built-in self-test domain of the dual mode built-in self-test controller upon receipt of at least one of a memory built-in self-test run signal and a memory built-in self-test select signal;

flushing the contents of a plurality of memory components to a known state after initialization of the components and the signals in the memory built-in self-test domain; and

testing the flushed memory components.

36. The method of claim 32, wherein obtaining the results includes reading at least one of a logic built-in self-test signature and a memory built-in self-test signature.

37. The method of claim 32, wherein interfacing the integrated circuit device with the tester includes employing Joint Test Action Group protocols.